The Complex Vowel Segment. A New Name: Tetraphtongs. Contextual Achievements

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Abstract

Throughout its dynamic evolution on the Romanian phonological territory, the vowel segment has suffered a series of expansions, from simple to complex, generating the current diphthongs and triphthongs. Historical phonetics does not mention all these phenomena, being prone to capitalize on the Latin heritage and not on the phonological loans. The current paradigm of the Romanian vowel system cannot neglect any neological loans, recorded in the latest Romanian dictionaries and considered as belonging, by extension, to Romanian language (the most self-evident example being DOOM2). Between theoretical and functional phonetics, as well as between the historical and the descriptive ones, there are a series of discrepancies, which the researchers adjust by omission, in order to avoid any disputes. Moreover, if it were to complete the paradigm of diphthongs and triphthongs, the Romanian phonetics does not take into account the tetraphthong, which is a group consisting of a vowel and three semivowels. This paper aims to achieve a complete picture, in which the description and contextualization of the complex vowel segment would be probative.

Keywords: complex vowel segment, diphthongs, triphthongs, tetraphthongs

Introductive notions

The complex vocalic segment is identified and defined, in opposition with the simple vocalic segment (made up of one vowel), as a group of sounds with vocalic tamber1. This one has a nucleus, represented by a syllabic vowel, to which one, two or three semi-vowels are added (also called asyllabic vowels). The maximum extension of the complex vocalic segment consequently is made up of 4 vocalic sounds, if one takes into consideration their occurrence inside the syllable (8, 126, where one has to mention the condition that the constituent elements of complex vocalic groups be in “homosyllabic relations”) and not every segment made up of successive vowels and semi-vowels, detachable from a certain sequence of the text.

The term “complex” brings to the vocalic segment the advantage of explaining its linear extension, by the “left-right” accumulation of semi-vowels in different situations: $V_1V$, $V_2V_1V$, $VV_1$ etc. (8, 126, where “...the V position is an allophonic syllable, and $V_2$, $V_1$ is allophonic asyllabic.”). At the same time it is obvious that the development creates complexity:

1 The semi-vowels $j$ (iot) and $w$ (digamma) are seen as semiconsonnants. In this case, the identification of the complex vocalic segment as group of sounds with exclusively vocalic tamber is to a certain extent without justification.
1) of selection of constituent elements: vowel (V) and semivowel (S)2;  
2) of combination – v. position of semivowel (semivowels) depending on the central vowel – pre-vocalic, post-vocalic, mixed, from which different types of vocalic groups result, depending on the number of the constituents and their position: ”complex vocalic nucleus” (19, 116);  
3) of distribution in the text, with their occurrence depending on the phonetic, morphologic and lexical conditions.

The complex vocalic segment which adds to the nucleus-vowel a semi-vocalic sequence is identified in speaking as a complex sound with vocalic tamber. Its main characteristics are:

1. “the continuous character of vocalic tamber” (8, 126, where it is mentioned that: “... continuity manifested in the possibility of gradual passing from acute and diffuse to low and compact and from low and diffuse to compact, and vice versa, from compact to acute and diffuse and to low and diffuse.”);  
2. intrasyllabic articulation (co-articulation);  
3. articulatory mobility, which facilitates the “mechanism of creating a complex vocalic segment by gradual evolution in one continuous emission from one aspect to another aspect of the vocalic tamber, as they are made in the acoustics of diphthongs and triphthongs in Romanian” (8, 126). Creating an algorithm one can identify the tracks of expansion (development) of the vocalic segment, as: anterior closed (palatal) → nonclosed (nonanterior, nonpalatal, which means central or posterior).

The standard structure of the complex vocalic segments can be identified depending on their components:

1. nucleus-vowel. Any of the vowels which exist in Romanian can be a nucleus (base, center) of a complex vocalic segment;  
2. semi-vowels (adjacent, nonsyllabic allophones with vocalic tamber). The series of vowels from the anterior series (palatal) e and i, and those in the posterior series (velar), o and u can perform this function (position). The vowels from the central series – a, ā and ĭ – never become semi-vowels; they only occur as nucleus-vowels (syllabic; center of the complex vocalic segment).

In order to distinguish the semi-vowels from the vowels they derive, one will use specific signs: ō (semi-vowel “o”), ē (semi-vowel “e”), w (digamma; semi-vowel “u” c), j (iot, iod; semi-vowel “i”). The four semi-vowels of the Romanian phonological system are not given in alphabetical order as they usually are (e, i, o, u) in most works, but according to the number and variety of relations created, from simple to complex3.

Types of complex vocalic segments

It is known that a complex vocalic segment is created by accumulation (association of semi-vowels to the nucleus-vowel). The following positions of the semivowels to the syllabic vowel can be identified:

a. to the left (anterior; ante-placed); in this case the vocalic segment is ascendant (climbing, progressive) and is signaled by ↑;  

2 To make this demonstration clearer and transparent we attributed the symbols V to vowels and S to semi-vowels, different from (8).

3 There is the possibility of the opposite exposure from complex to simple, but it would be less economical in the development of our paper.
b. to the right (posterior; post-placed); vocalic segment *descendent* (regressive), signaled by ↓;
c. in both parts-central; vocalic segment, signaled by ↑↓.

According to the number of added semi-vowels, the complex vocalic segments are classified in:

a. *diphthongs* (vowel + 1 semi-vowel), with two sub-types, according to the position of the semi-vowel: 
   - SV↑ – ascendant diphthong;
   - VS↓ – descendent diphthong;

b. *triphthongs* (vowel + 2 semi-vowels), with the following types:
   - SSV↑ – ascendant triphthong;
   - SVS↑↓ – central triphthong.

Due to phono-articulatory causes, triphthongs can not be descendent (the structure with two post-posed semi-vowels is not acceptable).

c. *tetraphtongs* (vowel + 3 semi-vowels), vocalic group that the Romanian phonology has ignored so far: 
   - SSVS↑↓ (ex. jőaj).

Tetraphthongs can only be (partly) central; in other words, the anterior semi-vowel sequence can only have 2 units. The posterior sequence is reduced to one unit.

**Diphthongs**

The *diphthongs* which exist in Latin have no relevance to the study of contemporary Romanian, because in popular Latin they became monophthongs. An exception was *aw* (e.g. aurum). In common Romanian, by specific phonetic transformations, other diphthongs appeared: je, ča, ďa, aj, ej, ij, oj, ej, ew, iw, ow, i.e. almost half of the Romanian diphthongs of today. Although this work does not want to create a diachronic vision on the identification and study of Romanian diphthongs, we can not overlook an example of research of the phenomenon in one of our first grammar books, namely Ianache Văcărescu’s book “*Observații sau băgări-dă-seamă asupra regulelor și orînduelelor grammaticii ruminești*” (“Observations or Notes on the Rules and Regulations of Romanian Grammar”, 1787): “We have 8 diphthongs: eu, ea, ia, io, ie, oa, ua, ou.” (2, 95. In order to facilitate the perception, I retorted to transliteration, as the diphthongs appear in original with Cyrillic letters). Leaving aside some exceptions, omissions or identifications, the number of diphthongs identified by Văcărescu is one accepted by specialists today. However, there are more diphthongs in Romanian nowadays.

**Diphthongs in literary Romanian**

The classification criteria are as follows:

a. according to the semi-vowel;
b. according to the position of the semi-vowel;
c. according to the nucleus-vowel.

The three criteria can be seen in the following table:
Table 1 – The Classification of the diphthongs in Romanian

<table>
<thead>
<tr>
<th></th>
<th>V</th>
<th>S</th>
<th>a</th>
<th>e</th>
<th>i</th>
<th>ă</th>
<th>ăi</th>
<th>o</th>
<th>u</th>
</tr>
</thead>
<tbody>
<tr>
<td>O</td>
<td>↑</td>
<td>ōa</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>E</td>
<td>↑</td>
<td>ēa</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>W</td>
<td>↑</td>
<td>wa</td>
<td>wā</td>
<td>wē</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>↓</td>
<td>aw</td>
<td>ew</td>
<td>iw</td>
<td>āw</td>
<td>ēw</td>
<td>ow</td>
<td>uw</td>
<td></td>
</tr>
<tr>
<td>J</td>
<td>↑</td>
<td>ja</td>
<td>je</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>↓</td>
<td>aj</td>
<td>ej</td>
<td>ij</td>
<td>āj</td>
<td>ēj</td>
<td>oj</td>
<td>uj</td>
<td></td>
</tr>
</tbody>
</table>

Legend: V = vowel; S = semi-vowel; P = the position of the semi-vowel

We may notice 24 diphthongs, out of which 10 (1 with ō, 2 with č, 3 with w, 4 with j) and 14 (7 with w, 7 with j). A special situation is that of uw, identified in words such as "ambigu"", "continuu", "perpetuu" etc. DOOM2 mentions that the correct way of making syllables in the case of these words separates the two final vowels: e.g. "ambigu", which separated in syllables becomes (am-bi)-gu-u [4, 29]; in this case the location of the diphthong is not valid, although phonologically the articulation is possible. With ō one can make one diphthong, and with č 2; the two semi-vowels make 3 ascendant diphthongs, while w has 10 (3↑ and 7↓), and j, 11 (4↑ şi 7↓), and this is the reason why researchers name ō and č semi-vowels, and j and w semi-consonants.

The hierarchy of the vowels in diphthongs: a is part of 6 diphthongs (4↑, 2↓); o makes 4 diphthongs (2↑, 2↓); e, ā, ĕ (and u, if we take into consideration uw) make tree diphthongs each (1↑, 2↓), and i, 2 diphthongs both descendent. These observations highlight “the attraction capacity” of the nucleus-vowel in a group, the “tracks” and mechanisms of complex vocalic segments, the number of selections and combinations on the same axis of articulation or on different axes.

Spoken language and dialectal diphthongs:

Although they do not occur in studies on phonology, the following diphthongs must be mentioned, since they frequently occur in colloquial speaking:

- wā, mentioned in the literary language, is considered part of a dialect in pronunciations like wās (var. of “os”) (6, 150);
- wo is only popular and dialectal: wom (var. of “om”), worb (“orb”, in the Banat), woră (“oră”);
- jă, in the pronunciation foajă (var. dial. of the “foaie”), motivated and etymological. (v. lat. folia).

A number of other dialectal diphthongs present combinations difficult to pronounce and hard to accept in the literary language such as ā, ţ and even ā, če etc.

Newly identified diphthongs:

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4 In the Romanian Treaty of Dialectology, on page 27, it is specified the fact that" The number of diphthongs in the subdialect from Banat is quite large and it occurs due to the process of diphthongization ("splitting") that the vowels appear to suffer, either in their initial position, or in the medial one, preceded by consonants, in stressed or unstressed position: e > j, ā > îă, i > ji, o > wo, u > wu: (să)te, ALRM II, h. 47; scăp; (bacere dă) jinimă” NALR-Ban., I, h. 100; wumăr NALR-Ban., I, h. 47..."
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- **we:** morphologically motivated; it appears in the conjugation of some verbs such as “înşeua” (e.g., “înşeuez”), “deşeua” (e.g., “deşeuez”), “ziuă” (e.g., “ziuez”);
- **lexically motivated:** DOOM2 includes, as new words, a series of widely used words from ordinary ones to those characteristic to science, spelled and pronounced as in their original language. In this case, bearing their pronunciation, the Romanian language also borrowed the diphthongs (and other phonic segments): westărn (“western”) (4, 854), cwestă (“cuestă”) etc.
- **wi:** lexically motivated; it appears in new words, like wig (English whig), windsârfing (English windsurfing) (4, 854).

Already mentioned in the category *spoken and dialectal diphthongs*, it is worth adding that the diphthong **wo** tends to become familiar in the spoken language due to the pressure of new words such as: affetuoso, con fuoco, ujgwom (engl. wigwam), wochitochi (walkie-talkie), wocmen (walkman), wotărpolo (waterpolo) (4, 854).

In other cases, although the pronunciation from DOOM2 is clear, that vocalic segment (diphthong) is difficult to pronounce in Romanian (e.g., the French word turned into Romanian  remaieuză, in which “ieu” represents the diphthong jö!).

**Table 2 – The Synthetic table of the diphthongs in Romanian**

<table>
<thead>
<tr>
<th>S</th>
<th>V</th>
<th>P</th>
</tr>
</thead>
<tbody>
<tr>
<td>ō</td>
<td>a</td>
<td>ōa</td>
</tr>
<tr>
<td>ē</td>
<td>e</td>
<td>ēa</td>
</tr>
<tr>
<td>w</td>
<td>i</td>
<td>wi</td>
</tr>
<tr>
<td>j</td>
<td>o</td>
<td>jo</td>
</tr>
<tr>
<td>u</td>
<td>u</td>
<td>uw</td>
</tr>
</tbody>
</table>

**Legend:** V = vowel; S = semi-vowel; P = the position of the semi-vowel

In conclusion, by analysing the table of the Romanian diphthongs, we can underline that within the limits and articulatory habits of the Romanian speaker, one can notice a growth in number and functionality, if not spectacular, at least obvious. Under these conditions the plano rejection of some phonetic phenomena becomes hazardous, "the issue is excluded in the same syllabic structure in↑ order combinations (i/ă, i/î, e/ă, e/î)” (8, 127, where it is specified that "It is excluded issue in the same order of textual syllable combinations ↑ u / u, u / i, u / e...").

**Triphtongs**

The complex vocalic segments, made up of vowel and 2 semi/vowel (triphtongs), are of two types, represented through the formulas: **SSV**↑ (ascendent triphtongs) and **SVS**↑↓ (central triphtongs). The total number of triphtongs mentioned in phonetics and phonology studies are different from an author to another from 7 to 13.

The table of Romanian triphtongs is made up according to the following criteria:

a) the central-vowel, identified as **a** or **e**;

b) the ascendent or central characters of triphtongs.

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5 In chapter Phonology from LRC, page 116, Emanuel Vasiliu highlights: „The triphtongs are made-up of the vowel /a/ or /e/ in syllabic function, all the other vowels that can be part of the triphtongs/e, o, i, u/ appear in non-syllabic function.”
Most works identify 2 ascendent triphthongs, and they both have a as nucleus-vowel: ăŏa (e.g. leoaarcă) and jŏa (e.g. aripioară)⁶

Other triphthongs should be included:

- jēa, etymologically motivated, but has disappeared from Romanian (lat. pop. “mele” > “mieare” > “miere”);
- wēa, morphologically motivated, in verbs such as “a înşeu” (e.g. înşuează);
- jwa, lexically motivated, by the neologism such as “yuan” (4, 856).

### Table 3 – Classification of central triphthongs according to the nucleus-vowel and their semi-vowel

<table>
<thead>
<tr>
<th>V</th>
<th>Hierarchy S</th>
<th>ĕao</th>
<th>ĕaw</th>
<th>waw</th>
<th>jaw</th>
</tr>
</thead>
<tbody>
<tr>
<td>a</td>
<td>ĕaj</td>
<td>ĕaj</td>
<td>ĕaw</td>
<td></td>
<td></td>
</tr>
<tr>
<td>o</td>
<td>ĕoj</td>
<td>woj</td>
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<tr>
<td>e</td>
<td>jej</td>
<td>jow</td>
<td></td>
<td></td>
<td></td>
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<tr>
<td>u</td>
<td>juj</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

**Legend:** V = vowel; S = semi-vowel

### Central triphthongs – popular and dialectal:

- ăaw: in mono-syllabic pronunciation of present indicative III-rd person plural of the verb „a lua” (there is also a triphthong ăaj popular in simple perfect of the same verb, pronounced as „luai”, mono-syllabic, by not „lu-ai”).
- woj: in popular pronunciation woj of the word „oi” (16, 362: „In the dialects of the north-eastern Transylvania there are triphthongs like ăaj, woj, formed by the anticipation of a palatal vocal tone from the following syllable wojchi... deăajche...”); in dialects there is also the pronunciation wâj for the same word;
- joj: mentioned as triphthongs in literary language, it also appears in popular variants of some words like jojte (var. of „iote” < „ia uite”) (MDA II, 85);
- juj: is included in dictionaries as an interjection (juj!) or as a variant of some regional words such as ljucă (< luică „swing”) (DA III, 391). The same as joj, juj that also appear in a variant of uite, jujte (Ibid.).

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⁶ In *Limba română contemporană* I. Iordan and Vl. Robu underlines the mechanism of creation for this particular class of triphthongs which makes a semi-vowel like ĕ or j be part of a diphthong ăa; result ăoa and joa. Since the main characteristic of vowels is continuity we highlight the fact that triphthongs can be obtained from diphthongs, just as diphthongs come from vowels. The formulas are also clear: ăoa and joa are made on the axis anterior → posterior → central. As in other situations, it is exaggerated the statement that holds true that “…it is impossible the forming of some complex segments from other vowels” (1978, 153).
Neological triphthongs:

- **waj**: already mentioned in the triphthongs table from Romanian it is confirmed by a series of neologisms (e.g. white-spirit, in which the first compounding element is read waj);

- **waw**: characteristic to the contemporary non-conformist spirit it is the English interjection wow!, read as waw;

- **jow**: neglected triphthong and even denied in some works, jow can not be ignored because of the French words borrowed by Romanian „boaiou” and „maiou” or English word „yeoman” (read as jowem) (4, 856);

- **jew**: is already identified among literary triphthongs, but it can also be a result of popular pronunciation (var. of „iau” = „apuc”) and the neologisms (e.g. milieu) (4, 490). Other researches have noticed that «a common feature in Muntenia, and in most of the daco-roman territory, is the pronunciation of the triphthong jew in the personal pronoun „mieiu” and jej in the plural „mici”, which is actually the ordinary situation for /e/ in the latin meus.» (16, 169).

In conclusion, leaving aside the popular triphthongs and accepting the triphthongs which are morphologically and neologically motivated we draw the conclusion that there are 17 triphthongs in Romanian, 4 ascendant and 13 central. As with diphthongs it is obvious the actual growth of the combinations due to a greater number of nucleus-vowels and to the greater use of the neologic phonetisms.

**Tetraphthongs**

Tetraphthongs are complex vocalic segments not identified in Romanian. To my knowledge, I am the first to mention such examples. Their structure is much more complex than that of diphthongs and triphthongs; more exactly the tetraphthong is made up of the nucleus-vowel and 3 semi-vowels, out of which 2 pre-posed and 1 post-posed, according to the formula SSVS↑↓. The number of vocalic segments mentioned as tetraphthong is 3, all of which have as center the vowel /a/:

1. **jŏaj** (anterior closed → posterior semi-open → central open → anterior closed).  
   **E.g.:** „... Hangerlioai(a) whispered something at the secretary’s ear...” (1, II, 289).

The tetraphthong is morphologically explained: Hangerliu (<tc. hançerli>) > hangerlioai(a) (with the suffix -oajcă); after a palatal consonant or a consonant followed by palatal vowel the vocalic segment is amplified by preiotation and become jŏaj. From this model we can consider that other feminine nouns can be altered by masculine nouns ended in palatal consonants (especially l, s, z, and others): „Halepliu” (with tc. suffix) or „Alexiu” (from the gr. -ios) and names derived with suffixes (e.g. Văsioiu, from Vasea, with fem. Văsioai(a) (11, 91), Axintioiu, Roşioiu; on condition that the syllables prove the tetraphthong – Ro-şioai-ca). We have found different sources such as Agrigorioaie (Elidia, folklorist) and Teoteoi (Tudor; historian).

**E.g.:** “Iacăt-o, nu mai vine ulioai(a) şi, când vede dihania moartă, începe a bate din aripi.” (3, 55)

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7 The term „tetraphthong” formed through analogy with diphthong and triphthong, is to be found in the first linguistic modern works (e.g. Iordache Goleșcu’s *Condia limbii rumânești*, where notions live: „imidiphthongs, mitriphthongs and imitetraphthongs” are to be found – having a Greek origin – unidentified yet.)
**Joaj** can also be an interjection, especially in familiar language or slang: „Joai, what a dream I’ve had.” (www.Joana’s little blog, 11 aug. 2010); „... incoştient am fost... ioai...” (Ibid., 28 nov. 2009); „Joai, iaoi, ioai... tare, tare!! Super tare!” (Ibid., 11 oct. 2009). In the specific language belonging to the forum writers, there is also the far-fetched explanation of the term: „Joai is a Hungarian-Romanian exclamation that sounds like a train siren” (Ibid., 7 sept. 2010). Of course, it is all about the Hungarian interjection ioi! (joj!), in a soft pronunciation, i.e. “moale”, deschis şi snob (v. şi oau!).

2. **ĕŏaj** (with the formula anterior semi-open → posterior semi-open → central open → anterior closed).

E.g.: dumnezeoaică (MDA II, 240); peşteoaică (MDA III, 1022), with the alternative peştioaică, probably influenced by the plural of the word (Ibid.);

3. **ĕŏaw** (with the formula anterior semi-open → posterior semi-open → central open → posterior closed).

E.g.: „... leoaucă” an absent word of „leucă” «part of a cart»; cf. lioacă” (9, 277).

One can notice that the formulas of tetraphthongs have symmetrical tracks, they begin on the anterior axes in the area of maximum or relative closing, have progressive opening, moving through velar area and rounding until total central opening, and close again to the final either palatal or velar. The result is a vocalic contour ample and expressive enough to be studied from articulatory distributional and functional point of view.

**Conclusions**

This research was based on different samples of language from different sources and has proved that the number of complex vocalic segments is greater than the initial one.

It has also proved the contribution of popular language, dialects and neologisms in Romanian.

According to the nucleus-vowel, constituent-semi-vowel of segments and to the number of combinatory possibilities, we drew up generative charts and we identified them in contexts.

We added the tetraphthong to the diphthong and triphthong, as it cannot be neglected in Romanian, although its occurrences and combinations are not as numerous as in the case of the others.

**Abbreviations**

- **cap.** chapter
- **cf.** confer
- **etc.** et cetera
- **e.g.** example
- **fem.** feminine
- **gr.** Greek
- **h.** map
- **ibid.** ibidem
- **lat.** Latin
- **lat. pop.** Vulgar Latin
- **pl.** plural
- **suf.** suffix
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tc. Turkish
v. see
var. variant
var. dial. dialectal variant

Signs and Symbols

> generates, becomes
< comes from
! accompanies interjections
+ marks agglutination
“ ” delimits excerpts
« » belong to the author, which stresses words or phrases from the text
á stressed vowel
= represents
V vowel
S semivowel
↑ ascending vocalic segment
↓ descending vocalic segment
↑↓ centered vocalic segment
→ marks the generation path of the vocalic segment

References

Segmentul vocalic dezvoltat (complex). Un nou nume: tetraftongii. Realizări contextuale

Rezumat

În dinamica evoluției sale pe teritoriul fonologiei românești, segmentul vocalic a suferit o serie de expansiuni, de la simplu la complex, generând diftongii și triftongii actuali. Fonetica istorică nu consenmează totalitatea acestor fenomene, având predilecție pentru valorificarea moștenirii latine și nu pentru împrumuturile fonologice. Paradigma actuală a vocalismului românesc nu poate neglija nici împrumuturile neologice, consenmate în cele mai noi dicționare românești și considerate ca aparținând, prin extensie, limbii române (exemplul cel mai edificator fiind DOOM2). Între fonetica teoretică și cea funcțională, ca și între fonetica istorică și cea descriptivă, se nasc astfel o serie de discrepanțe, pe care cercetătorii, pentru a nu cădea în litigii, le reglează prin omisiune. Mai mult decât atât, dacă paradigma diftongilor și cea a triftongilor ar putea fi completată, fonetica românească nu ia deloc în considerare tetraftongul, grup constituit dintr-o vocală și trei semivocale. Lucrarea de față își propune să realizeze un tablou complet, în care descrierea și contextualizarea segmentului vocalic complex să fie realizate edificator.